

State of Utah

DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF AIR QUALITY

Michael O. Leavitt
Governor

Dianne R. Nielson, Ph.D.
Executive Director

Richard W. Sprott
Director

150 North 1950 West
P.O. Box 144820
Salt Lake City, Utah 84114-4820
(801) 536-4099 Fax
(801) 536-4414 T.D.D.
Web: www.deq.utah.gov

Title V Operating Permit

PERMIT NUMBER: 100008001

DATE OF PERMIT: December 1, 1997

Date of Last Revision: July 12, 2002

This Operating Permit is issued to, and applies to the following:

Name of Permittee:

Provo City Power
Department of Energy
251 W 800 N
Provo, UT 84601

Permitted Location:

Bonnett-Geothermal Power Plant
#1 Main
Sulphurdale, UT 84713

UTM coordinates: 4,251,776 meters Northing, 324,468 meters Easting
SIC code: 4911

ABSTRACT

The Bonnett Geothermal Power Plant uses underground steam and hot water to generate electricity. The power plant consists of six turbines and is rated at 10 megawatts. The hydrogen sulfide in the non-condensable gas is reduced to a sulfur slurry by a low temperature catalytic oxidizer (Low-Cat Unit). The Bonnett Geothermal Power Plant is a major source of hydrogen sulfide (H₂S).

UTAH AIR QUALITY BOARD

By:

Richard W. Sprott, Executive Secretary

Prepared By:

James Chapman

Operating Permit History

12/1/97 - Permit issued	Action initiated by an initial operating permit application	
7/14/98 -Permit modified	Action initiated by a reopening of an operating permit for cause	to modify Provision I.U.1 of the permit to reference the inventory rule directly.
7/12/02 -Permit modified	Action initiated by an administrative amendment (initiated by DAQ)	to incorporate a new stack test requirement of the new approval order issued June 24, 2002. (DAQE-AN0319002-02)

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Issued under authority of Utah Code Ann. Section 19-2-104 and 19-2-109.1, and in accordance with Utah Administrative Code R307-415 Operating Permit Requirements.

All definitions, terms and abbreviations used in this permit conform to those used in Utah Administrative Code R307-101 and R307-415 (Rules), and 40 Code of Federal Regulations (CFR), except as otherwise defined in this permit. Unless noted otherwise, references cited in the permit conditions refer to the Rules.

Where a permit condition in Section I, General Provisions, partially recites or summarizes an applicable rule, the full text of the applicable portion of the rule shall govern interpretations of the requirements of the rule. In the case of a conflict between the Rules and the permit terms and conditions of Section II, Special Provisions, the permit terms and conditions of Section II shall govern except as noted in Provision I.M, Permit Shield.

Section I: General Provisions

I.A. Federal Enforcement.

All terms and conditions in this permit, including those provisions designed to limit the potential to emit, are enforceable by the EPA and citizens under the Clean Air Act of 1990 (CAA) except those terms and conditions that are specifically designated as "State Requirements". (R307-415-6b)

I.B. Permitted Activity(ies).

Except as provided in R307-415-7b(1), the permittee may not operate except in compliance with this permit. (See also Provision I.E, Application Shield)

I.C. Duty to Comply.

I.C.1 The permittee must comply with all conditions of the operating permit. Any permit noncompliance constitutes a violation of the Air Conservation Act and is grounds for any of the following: enforcement action; permit termination; revocation and reissuance; modification; or denial of a permit renewal application. (R307-415-6a(6)(a))

I.C.2 It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. (R307-415-6a(6)(b))

I.C.3 The permittee shall furnish to the Executive Secretary, within a reasonable time, any information that the Executive Secretary may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. Upon request, the permittee shall also furnish to the Executive Secretary copies of records required to be kept by this permit or, for information claimed to be confidential, the permittee may furnish such records directly to the EPA along with a claim of confidentiality. (R307-415-6a(6)(e))

I.C.4 This permit may be modified, revoked, reopened, and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance shall not stay

any permit condition, except as provided under R307-415-7f(1) for minor permit modifications. (R307-415-6a(6)(c))

I.D. Permit Expiration and Renewal.

I.D.1 **This permit is issued for a fixed term of five years and expires on December 1, 2002.** (R307-415-6a(2))

I.D.2 Application for renewal of this permit is due by June 1, 2002. An application may be submitted early for any reason. (R307-415-5a(1)(c))

I.D.3 An application for renewal submitted after the due date listed in I.D.2 above shall be accepted for processing, but shall not be considered a timely application and shall not relieve the permittee of any enforcement actions resulting from submitting a late application. (R307-415-5a(5))

I.D.4 Permit expiration terminates the permittee's right to operate unless a timely and complete renewal application is submitted consistent with R307-415-7b (see also Provision I.E, Application Shield) and R307-415-5a(1)(c) (see also Provision I.D.2). (R307-415-7c(2))

I.E. Application Shield.

If the permittee submits a timely and complete application for renewal, the permittee's failure to have an operating permit will not be a violation of R307-415, until the Executive Secretary takes final action on the permit renewal application. In such case, the terms and conditions of this permit shall remain in force until permit renewal or denial. This protection shall cease to apply if, subsequent to the completeness determination required pursuant to R307-415-7a(3), and as required by R307-415-5a(2), the applicant fails to submit by the deadline specified in writing by the Executive Secretary any additional information identified as being needed to process the application. (R307-415-7b(2))

I.F. Severability.

In the event of a challenge to any portion of this permit, or if any portion of this permit is held invalid, the remaining permit conditions remain valid and in force. (R307-415-6a(5))

I.G. Permit Fee.

I.G.1 The permittee shall pay an annual emission fee to the Executive Secretary consistent with R307-415-9. (R307-415-6a(7))

I.G.2 The emission fee shall be due on October 1 of each calendar year or 45 days after the source receives notice of the amount of the fee, whichever is later. (R307-415-9(4)(a))

I.H. No Property Rights.

This permit does not convey any property rights of any sort, or any exclusive privilege. (R307-415-6a(6)(d))

I.I. Revision Exception.

No permit revision shall be required, under any approved economic incentives, marketable permits, emissions trading and other similar programs or processes for changes that are provided for in this permit. (R307-415-6a(8))

I.J. Inspection and Entry.

I.J.1 Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Executive Secretary or an authorized representative to perform any of the following:

I.J.1.a Enter upon the permittee's premises where the source is located or emissions related activity is conducted, or where records are kept under the conditions of this permit. (R307-415-6c(2)(a))

I.J.1.b Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit. (R307-415-6c(2)(b))

I.J.1.c Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practice, or operation regulated or required under this permit. (R307-415-6c(2)(c))

I.J.1.d Sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with this permit or applicable requirements. (R307-415-6c(2)(d))

I.J.2 Any claims of confidentiality made on the information obtained during an inspection shall be made pursuant to Utah Code Ann. Section 19-1-306. (R307-415-6c(2)(e))

I.K. Certification.

Any application form, report, or compliance certification submitted pursuant to this permit shall contain certification as to its truth, accuracy, and completeness, by a responsible official as defined in R307-415-3. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. (R307-415-5d)

I.L. Compliance Certification.

I.L.1 Permittee shall submit to the Executive Secretary an annual compliance certification, certifying compliance with the terms and conditions contained in this permit, including emission limitations, standards, or work practices. This certification shall be submitted no later than March 31, 2003 and that date each year following until this permit expires. The certification shall include all the following (permittee may cross-reference this permit or previous reports): (R307-415-6c(5))

I.L.1.a The identification of each term or condition of this permit that is the basis of the certification;

I.L.1.b The identification of the methods or other means used by the permittee for determining the compliance status with each term and condition during the certification period, and whether such methods or other means provide continuous or intermittent data. Such

methods and other means shall include, at a minimum, the monitoring and related recordkeeping and reporting requirements in this permit. If necessary, the permittee also shall identify any other material information that must be included in the certification to comply with section 113(c)(2) of the Act, which prohibits knowingly making a false certification or omitting material information;

- I.L.1.c The status of compliance with the terms and conditions of the permit for the period covered by the certification, based on the method or means designated in Provision I.L.1.b. The certification shall identify each deviation and take it into account in the compliance certification. The certification shall also identify as possible exceptions to compliance any periods during which compliance is required and in which an excursion or exceedance as defined under 40 CFR Part 64 occurred; and
- I.L.1.d Such other facts as the Executive Secretary may require to determine the compliance status.
- I.L.2 The permittee shall also submit all compliance certifications to the EPA, Region VIII, at the following address or to such other address as may be required by the Executive Secretary: (R307-415-6c(5)(d))

Office of Enforcement, Compliance and Environmental Justice
(mail code 8ENF)
EPA, Region VIII
999 18th Street, Suite 300
Denver, CO 80202-2466

I.M. Permit Shield.

- I.M.1 Compliance with the provisions of this permit shall be deemed compliance with any applicable requirements as of the date of this permit, provided that:
- I.M.1.a Such applicable requirements are included and are specifically identified in this permit, or (R307-415-6f(1)(a))
- I.M.1.b Those requirements not applicable to the source are specifically identified and listed in this permit. (R307-415-6f(1)(b))
- I.M.2 Nothing in this permit shall alter or affect any of the following:
- I.M.2.a The emergency provisions of Utah Code Ann. Section 19-1-202 and Section 19-2-112, and the provisions of the CAA Section 303. (R307-415-6f(3)(a))
- I.M.2.b The liability of the owner or operator of the source for any violation of applicable requirements under Utah Code Ann. Section 19-2-107(2)(g) and Section 19-2-110 prior to or at the time of issuance of this permit. (R307-415-6f(3)(b))
- I.M.2.c The applicable requirements of the Acid Rain Program, consistent with the CAA Section 408(a). (R307-415-6f(3)(c))

I.M.2.d The ability of the Executive Secretary to obtain information from the source under Utah Code Ann. Section 19-2-120, and the ability of the EPA to obtain information from the source under the CAA Section 114. (R307-415-6f(3)(d))

I.N. Emergency Provision.

I.N.1 An “emergency” is any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under this permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventive maintenance, careless or improper operation, or operator error. (R307-415-6g(1))

I.N.2 An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the affirmative defense is demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:

I.N.2.a An emergency occurred and the permittee can identify the causes of the emergency. (R307-415-6g(3)(a))

I.N.2.b The permitted facility was at the time being properly operated. (R307-415-6g(3)(b))

I.N.2.c During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in this permit. (R307-415-6g(3)(c))

I.N.2.d The permittee submitted notice of the emergency to the Executive Secretary within two working days of the time when emission limitations were exceeded due to the emergency. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken. This notice fulfills the requirement of Provision I.S.2.c below. (R307-415-6g(3)(d))

I.N.3 In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof. (R307-415-6g(4))

I.N.4 This emergency provision is in addition to any emergency or upset provision contained in any other section of this permit. (R307-415-6g(5))

I.O. Operational Flexibility.

Operational flexibility is governed by R307-415-7d(1).

I.P. Off-permit Changes.

Off-permit changes are governed by R307-415-7d(2).

I.Q. Administrative Permit Amendments.

Administrative permit amendments are governed by R307-415-7e.

I.R. **Permit Modifications.**

Permit modifications are governed by R307-415-7f.

I.S. **Records and Reporting.**

I.S.1 Records.

I.S.1.a The records of all required monitoring data and support information shall be retained by the permittee for a period of at least five years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records, all original strip-charts or appropriate recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. (R307-415-6a(3)(b)(ii))

I.S.1.b For all monitoring requirements described in Section II, Special Provisions, the source shall record the following information, where applicable: (R307-415-6a(3)(b)(i))

I.S.1.b.1 The date, place as defined in this permit, and time of sampling or measurement.

I.S.1.b.2 The date analyses were performed.

I.S.1.b.3 The company or entity that performed the analyses.

I.S.1.b.4 The analytical techniques or methods used.

I.S.1.b.5 The results of such analyses.

I.S.1.b.6 The operating conditions as existing at the time of sampling or measurement.

I.S.1.c Additional record keeping requirements, if any, are described in Section II, Special Provisions.

I.S.2 Reports.

I.S.2.a Monitoring reports shall be submitted to the Executive Secretary every six months, or more frequently if specified in Section II. All instances of deviation from permit requirements shall be clearly identified in the reports. (R307-415-6a(3)(c)(i))

I.S.2.b All reports submitted pursuant to Provision I.S.2.a shall be certified by a responsible official in accordance with Provision I.K of this permit. (R307-415-6a(3)(c)(i))

I.S.2.c The Executive Secretary shall be notified promptly of any deviations from permit requirements including those attributable to upset conditions as defined in this permit, the probable cause of such deviations, and any corrective actions or preventative measures taken. **Prompt, as used in this condition, shall be defined as written notification within 7 days.** Deviations from permit requirements due to unavoidable breakdowns shall be reported in accordance with the provisions of R307-107. (R307-415-6a(3)(c)(ii))

I.S.3 Notification Addresses.

I.S.3.a All reports, notifications, or other submissions required by this permit to be submitted to the Executive Secretary are to be sent to the following address or to such other address as may be required by the Executive Secretary:

Utah Division of Air Quality
P.O. Box 144820
Salt Lake City, UT 84114-4820
Phone: 801-536-4000

I.S.3.b All reports, notifications or other submissions required by this permit to be submitted to the EPA should be sent to one of the following addresses or to such other address as may be required by the Executive Secretary:

For annual compliance certifications

Environmental Protection Agency, Region VIII
Office of Enforcement, Compliance and
Environmental Justice (mail code 8ENF)
999 18th Street, Suite 300
Denver, CO 80202-2466

For reports, notifications, or other correspondence
related to permit modifications, applications, etc.

Environmental Protection Agency, Region VIII
Office of Partnerships & Regulatory Assistance
Air & Radiation Program (mail code 8P-AR)
999 18th Street, Suite 300
Denver, CO 80202-2466
Phone: 303-312-6440

I.T. **Reopening for Cause.**

I.T.1 A permit shall be reopened and revised under any of the following circumstances:

I.T.1.a New applicable requirements become applicable to the permittee and there is a remaining permit term of three or more years. No such reopening is required if the effective date of the requirement is later than the date on which this permit is due to expire, unless the terms and conditions of this permit have been extended pursuant to R307-415-7c(3), application shield. (R307-415-7g(1)(a))

I.T.1.b The Executive Secretary or EPA determines that this permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of this permit. (R307-415-7g(1)(c))

I.T.1.c EPA or the Executive Secretary determines that this permit must be revised or revoked to assure compliance with applicable requirements. (R307-415-7g(1)(d))

I.T.1.d Additional applicable requirements are to become effective before the renewal date of this permit and are in conflict with existing permit conditions. (R307-415-7g(1)(e))

I.T.2 Proceedings to reopen and issue a permit shall follow the same procedures as apply to initial permit issuance and shall affect only those parts of this permit for which cause to reopen exists. (R307-415-7g(2))

I.U. **Inventory Requirements.**

I.U.1 An emission inventory shall be submitted in accordance with the procedures of R307-150, Emission Inventories. (R307-150)

I.U.2 A Hazardous Air Pollutant Inventory shall be submitted in accordance with the procedures of R307-155, Hazardous Air Pollutant Inventory. (R307-155)

Section II: SPECIAL PROVISIONS

II.A. Emission Unit(s) Permitted to Discharge Air Contaminants.

(R307-415-4(3)(a) and R307-415-4(4))

II.A.1 10 Megawatt Generation Facility (designated as Unit #1)

Unit Description: includes one 1.9 MW turbine, four 0.6 MW turbines, one 8.5 MW turbine, and one low-Cat Unit to control the H₂S emissions from all turbines

II.B. Requirements and limitations.

The following emission limitations, standards, and operational limitations apply to the permitted facility as indicated: (R307-415-6a(1))

II.B.1 Conditions on permitted source (Source-wide)

II.B.1.a Condition:

Uncontrolled venting Hydrogen sulfide shall be no greater than 16 days per rolling 12-month period. [Authority granted under R307-401-6(1) [BACT]; condition originated in DAQE-AN0319002-02]

II.B.1.a.1 Monitoring:

The venting shall be recorded and the total days of venting shall be summarized each month. Within the first 10 days of each month, a new 12-month total shall be calculated using the previous 12-month sums of the days of the venting.

II.B.1.a.2 Recordkeeping:

Results of monitoring shall be maintained in accordance with Provision I.S.1 of this permit.

II.B.1.a.3 Reporting:

There are no reporting requirements for this provision except those specified in Section I of this permit.

II.B.2 Conditions on 10 Megawatt Generation Facility (Unit #1)

II.B.2.a Condition:

Emissions of Hydrogen sulfide shall be no greater than 17.78 lb/hr averaged over rolling 26-week period. [Authority granted under R307-401-6(1) [BACT]; condition originated in DAQE-AN0319002-02]

II.B.2.a.1 Monitoring:

Detection tube such as draeger tube shall be used to measure the H₂S emissions in the outlet of the Low-Cat Unit every seven days. Samples are taken when the plant is producing the full amount of electricity possible with the available resource.

The following equation shall be used to convert the H₂S concentration in ppm to lb/hr:

$$\text{H}_2\text{S (lb/hr)} = (\text{H}_2\text{S concentration in ppm} \times \text{flowrate in Mscf/hr}) / 11,340$$

Where Mscf is thousand standard cubic feet at standard condition of 68 degrees F and 14.7 psia and measured by a flow meter.

A 26-week rolling average of the H₂S emission rate shall be used to determine the compliance with the limitation. After the detection tube results are obtained each week, a new 26-week average shall be calculated using data from the previous 26 weeks.

If the 26-week rolling average of the H₂S emission rate as determined by the detection tube is above 90% of the emission limit, a stack test shall be performed within 60 days to validate the detection tube accuracy and the compliance status.

Stack testing to show compliance with this emission limitation for H₂S shall be performed as specified here:

(a) Notification. The source shall provide a notification of the test date at least 30 days before the test. A pretest conference shall be held if directed by the Executive Secretary between the permittee, the tester, and the Executive Secretary.

(b) The emission sample point shall be designed to conform to the requirements of 40 CFR Part 60, Appendix A, Method 1.

(c) Methods to be used:

- (1) To determine stack volumetric flow rate - 40 CFR Part 60, Method 2.
- (2) To test for H₂S emissions - 40 CFR Part 60, Appendix A, Method 15

(d) Calculations. To determine mass emission rates (lbs/hr) the pollutant concentration as determined by the appropriate methods above shall be multiplied by the volumetric flow rate, and any necessary conversion factors.

(e) Production Rate During Testing. Stack test shall be performed when the plant is producing the full amount of electricity possible with the available resource.

II.B.2.a.2

Recordkeeping:

Results of monitoring shall be maintained in accordance with Provision I.S.1 of this permit.

II.B.2.a.3

Reporting:

The results of stack testing shall be submitted to the Executive Secretary within 60 days of completion of the testing. Reports shall clearly identify results as compared to permit limits and indicate compliance status. There are no additional reporting requirements for this provision except those specified in Section I of this permit.

II.B.2.b

Condition:

The referenced unit shall be operated with no visible emissions. [Authority granted under R307-401-6(1) [BACT]; condition originated in DAQE-AN0319002-02]

II.B.2.b.1

Monitoring:

A visual determination of each affected emission unit shall be conducted on a monthly basis using 40 CFR 60, Appendix A, Method 22. The observation period shall be 20 minutes.

II.B.2.b.2

Recordkeeping:

Results of monitoring shall be maintained in accordance with Provision I.S.1 of this permit.

II.B.2.b.3

Reporting:

There are no reporting requirements for this provision except those specified in Section I of this permit.

II.C. **Emissions Trading.**

(R307-415-6a(10))

Not applicable to this source.

II.D. **Alternative Operating Scenarios.**

(R307-415-6a(9))

Not applicable to this source.

Section III: PERMIT SHIELD

A permit shield was not granted for any specific requirements.

Section IV: ACID RAIN PROVISIONS.

This source is not subject to Title IV. This section is not applicable.

REVIEWER COMMENTS

This operating permit incorporates all applicable requirements contained in the following documents:

DAQE-AN0319002-02

dated June 24, 2002

1. Comment on an item originating in DAQE-AN0319002-02, Condition #12 regarding permitted source (Source-wide)

Explanation of Emission Calculation: The H₂S concentration in ppm is converted to lb/hr by the following equation:

$$\text{H}_2\text{S in lb/hr} = [\text{ppm in (lb mole H}_2\text{S/lb mole gas)} \times 10^{(-6)}] \times (\text{lb mole gas/385.4 scf}) \times [\text{flowrate in Mscf} \times 10^3/\text{hr}] \times (34 \text{ lb H}_2\text{S/lb mole H}_2\text{S}) = (\text{ppm} \times \text{flowrate in Mscf})/11,340$$

where scf means standard cubic feet (volume at 68 degree F and 14.7 psia and Mscf means thousand standard cubic feet. [Comment last updated on 7/12/2002]

2. Comment on an item originating in DAQE-AN0319002-02 regarding permitted source (Source-wide)

Uncontrolled emissions: The condition #11 in the AO, allows uncontrolled well venting of up to 16 days per 12-month period. The power plant clarifies that the uncontrolled emissions include the operation of the divert valve and should be a source-wide limitation. [Comment last updated on 7/12/2002]